by this apparatus—a determination very difficult with the ordinary candle. Its light, also, is fixed and immovable and not waving like the ordinary flame, permitting much greater precision and exactness.

Injections of Vaseline after Enucleation of the Eyeball.—DIANOUX (*Gaz. Méd. de Nantes*, 1901, No. 31) recommends the injection of vaseline after enucleation for the purpose of giving the stump a convex shape forward in place of the concavity ordinarily obtained. The injection is practised into the soft tissues in the axis of the orbit to a depth of 5 or 6 mm., after all inflammatory reaction has disappeared. He concludes: 1. That the injection of vaseline is entirely harmless. 2. That any degree of projection desired can be given to the tissues. 3. That the stump thus obtained possesses great mobility. 4. That a radical reform is to be expected in the shape of artificial eyes.

HYGIENE AND PUBLIC HEALTH.

UNDER THE CHARGE OF

CHARLES HARRINGTON, M.D.,

ASSISTANT PROFESSOR OF HYGIENE, HARVARD MEDICAL SCHOOL,

AND

EDWARD F. WILLOUGHBY, M.D.,

OF LONDON.

The Possibility of Infection by Minute Droplets Thrown Out in Speaking, Coughing, and Sneezing.—Bearing on the contention of Flügge, denied by Cornet, that the transmission of pulmonary tuberculosis from one person to another is chiefly by means of the finest droplets thrown into the air in speaking, coughing, and sneezing, the experiments of DR. H. KOENIGER (*Zeitschrift für Hygiene und Infectionskrankheiten*, xxxiv., p. 119) are of interest. In order to give the expelled droplets a character which would enable them to be traced, he rinsed his mouth with liquid rich in *B. prodigiosus* or *B. mycoides* or with very dilute caustic soda. When the bacteria were employed, Petri dishes were exposed at different heights and distances, but when the alkali was used in place of the Petri dishes, glass plates coated with phenolphthalein were exposed. Since this agent turns pink when an alkali is brought in contact therewith, this method enables one to determine not only the number of the droplets, but their size as well. Shortly after rinsing the mouth and rejecting the surplus, he would take a position in a room, avoiding as much as possible unnecessary stirring up of the air, and then speak, sneeze, and cough. After an interval the number of colonies was determined. Tests were made with single letters, with different kinds of speaking by the same person and by different persons—loud, soft, and whispering—and to determine the influence of rapidity. It was found that no droplets are thrown out in ordinary exhalation, nor in vowel formation, while the number is very great with consonants, as *t*, *k*, and *p*, which originate by the sudden release of air under pressure in the mouth cavity, the number depending upon the amount of force with which it is released, and hence largely proportionate to the manner of pronouncing and to the sharpness of consonant formation. Loudness and rapidity have but little influence; indeed, whispering may, under some conditions, cause a greater number of droplets than loud speech. Even with subdued speech and a quiet atmosphere, it was found that the organisms expelled penetrated into the farthest parts of the room, which was over twenty feet in width, and not alone forward, but sideways and backward from the speaker. The bacteria were found not to remain in supension in the air longer than an hour, and it was noticed that they fell upon the plates in groups, sometimes as many as forty close together. This suggests that the bacteria in the droplets do not fall as dry dust particles, but that the droplets themselves, with their contained or adherent organisms, are deposited. The *B mycoides*, which is larger than *B. prodigiosus*, was conveyed through much shorter distances and remained in suspension a much shorter time. In coughing and sneezing, more droplets are expelled than in speaking, and they are thrown to a greater distance, because of the greater amount of force employed.

The danger of infection through droplets can be prevented in great part by holding the hand or a handkerchief before the mouth while sneezing or coughing. Speaking should be restricted as much as possible, and in especially serious conditions the use of gauze veils before the mouth may be advised. Thus the air itself and all objects in the vicinity of the patient will be protected from infection. The precautions mentioned apply not alone to tuberculosis, but to diphtheria, whooping-cough, and other diseases, the organisms of which are found in the air-passages.

The Toxin of the Colon Bacillus.—Since the discovery by PROFESSOR V. C. VAUGHAN and MCCLYMONDS that practically all samples of American cheese contain the colon bacillus and that cultures of this organism may be boiled without destroying its toxicity, work on its toxin has been carried further by the former (*American Medicine*, May 18, 1901, p. 302), assisted by Cooley and Gelston. The bacilli with which they worked were obtained from cheese, water, and normal feces, and their virulence was intensified by passage through a number of animals. After inoculation of Roux flasks of 2 per cent. agar with a beef-tea culture of the bacillus and subsequent incubation, the growths were scraped from the surface of the agar and used in the preparation of the toxin. The facts learned from numerous experiments with the germ substance thus obtained are summed up as follows: The toxin is contained within the germ-cell, from which it does not, at least under ordinary conditions, diffuse into the culture medium. It is not extracted from the cell by alcohol, ether, or .ery dilute alkalies, nor is it destroyed when the germ-substance is heated to a high temperature with water. Neither the germ-cell nor its toxin is much, if at all, affected by boiling with a 2 per cent. solution of hydrochloric acid, but the former is broken up and the latter affected, but not destroyed, by being heated for an hour on the water-bath with water containing from 1 to 5 per cent. of the acid, and the toxin is made inert by prolonged heating. The toxin, separated from the cell wall by digestion of the latter with 2 per cent. hydro-